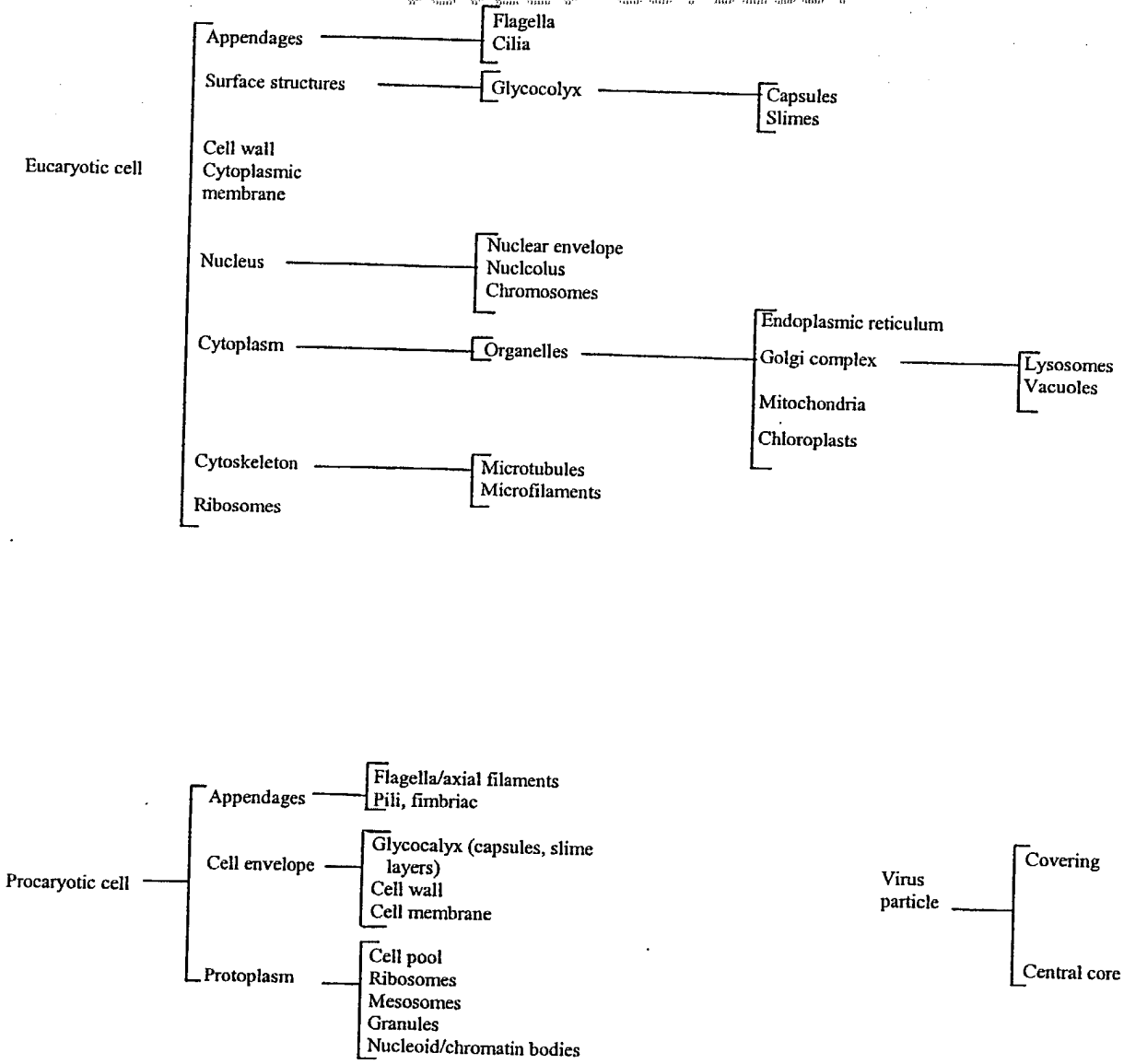

FIG. 1

Photokilling of different microorganisms using methylene blue-benzalkonium mediated photodynamic therapy.

Organism	Methylene Blue (μg/mL)	Benzalkonium (%)	Power[a] (W)	Dose Rate (mW/cm^2)	Light Dose (J/cm^2)	Treatment	
						No Light	Light
C. albicans (patient iso.)	0	0.0075	N/a[b]	N/a	N/a	3[c]	N/a
	100	0	113	100	40	N/a	2
	100	0.005	"	"	"	N/a	0
C. albicans 14053	0	0.0075	N/a	N/a	N/a	2 (19)	N/a
	100	0	113	100	30	N/a	1 (3)
	100	0.005	"	"	"	N/a	0
E. coli 35218	0	0.0075	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	2
	50	0.005	"	"	"	N/a	1
	50	0.0075	"	"	"	N/a	0
E. faecalis 51229	0	0.0075	N/a	N/a	N/a	2 (13)	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
H. influenzae (patient iso.)	0	0.005	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
K. pneumoniae 13882	0	0.0075	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
P. aeruginosa 27853	0	0.01	N/a	N/a	N/a	2	N/a
	100	0	113	100	40	N/a	4
	100	0.01	"	"	"	N/a	0
S. marcescens (patient iso.)	0	0.0075	N/a	N/a	N/a	0	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
S. aureus 29213	0	0.0075	N/a	N/a	N/a	1 (4)	N/a
	50	0	113	100	30	N/a	1
	50	0.005	"	"	"	N/a	0
S. pneumoniae 49619	0	0.005	N/a	N/a	N/a	0	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0

[a]Wavelength = 664 nm.

[b]N/a = Not applicable.

[c]Qualitative score: 0 = no growth, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+, ( ) = number of colonies.

FIG. 2

Photokilling of bacterial spores using methylene green-benzalkonium chloride mediated photodynamic therapy.

Organism	Methylene Green (μg/mL)	Benzalkonium (%)	Power[a] (W)	Dose Rate (mW/cm^2)	Treatment		
					Light Dose (J/cm^2)	No Light	Light
Bacillus subtilis 19659	0	0	N/a[b]	N/a	N/a	4[c]	N/a
	0	0.3	N/a	N/a	N/a	1 (2)	N/a
	0	0.5	N/a	N/a	N/a	1	N/a
	150	0	170	150	60	N/a	4
	150	0.3	"	"	"	N/a	2 (15)
	150	0.5	"	"	"	N/a	1
	200	0	"	"	"	N/a	4
	200	0.3	"	"	"	N/a	2 (8)
	200	0.5	"	"	"	N/a	1
	250	0	"	"	"	N/a	4
	250	0.3	"	"	"	N/a	0
	250	0.5	"	"	"	N/a	0

[a]Wavelength = 664 nm.

[b]N/a = Not applicable.

[c]Qualitative score: 0 = no growth, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+, ( ) = number of colonies.

FIG. 3

Photodynamic Therapy of Endotracheal Tubes using Methylene Blue and Benzalkonium Chloride

Patient	Intubation (Days)	Illness	Antibiotic	MB (μg/mL)	Benz (%)	Treatment Stage[a]		
						M-L-[b]	M+L+[c]	2L+[d]
MK	4	Pneumonia	Ceftriaxone	200	0.01	4[e]	0	0
MS	11	Pneumonia	Rocephin	"	"	4	0	0
MB	1	Surgery	N/a	"	"	0	0	0
NV	3	Pneumonia	Ampicillin	"	"	2	0	0
JF	3	Pneumonia	Primaxim	"	"	2	0	0
SR	3	Pneumonia	Tequin	"	"	4	2	0
AW	2	Surgery	N/a	"	0.0075	4	3	2
MZ	16	Pneumonia	Amt, Cln, Imi, Teq, Van	"	0.0075	4	4	4

N/a = not applicable.

[a]Laser criteria: power = 800 mW, dose rate = 300 mW/cm, light dose = 70 J/cm, time = 233 sec

[b]M-L- = no methylene blue or light activation.

[c]M+L+ = methylene blue and light activation.

[d]2L+ = double light activation.

[e]Qualitative score: 0 = 0 colonies, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+

FIG. 4

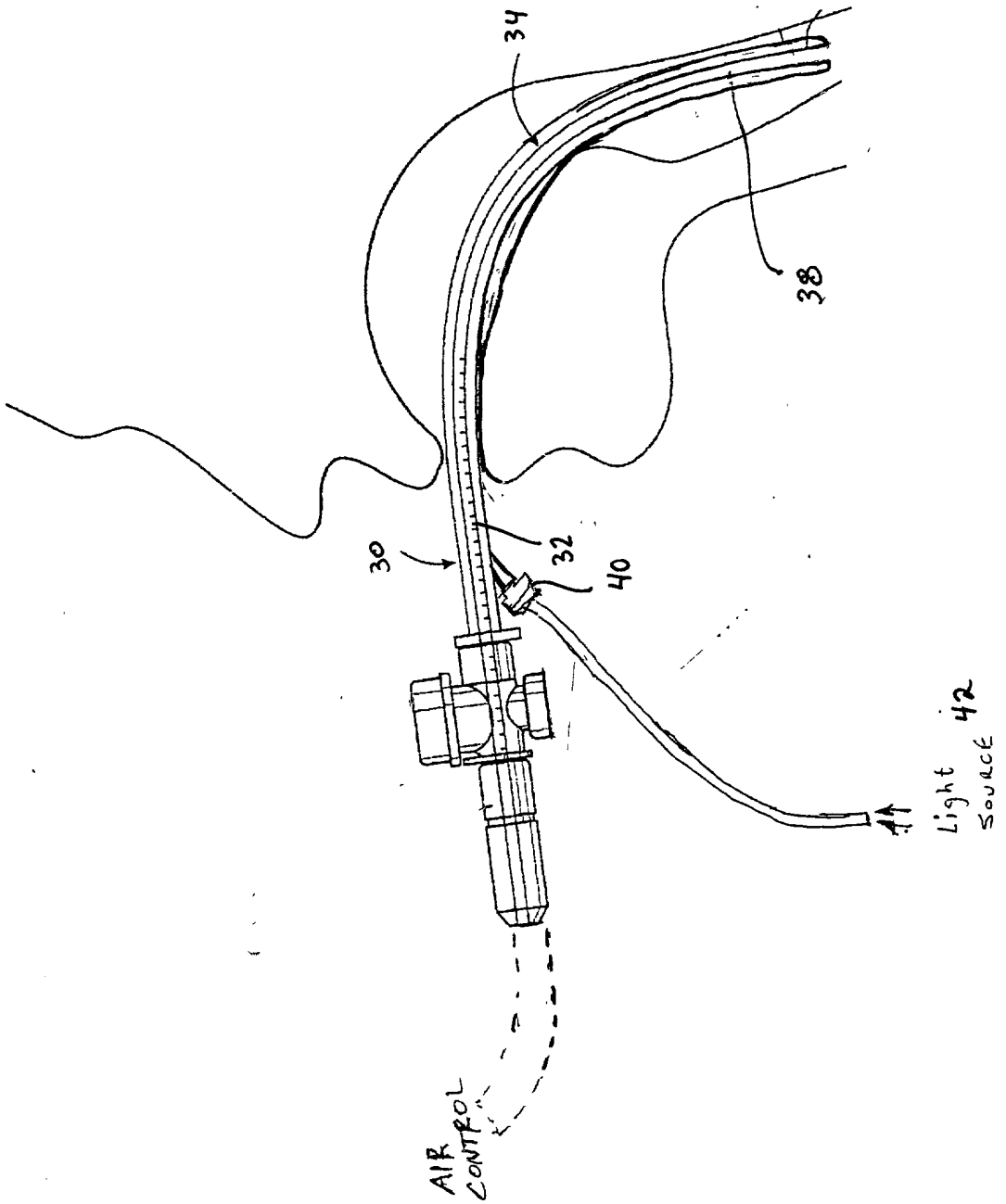

FIG. 5

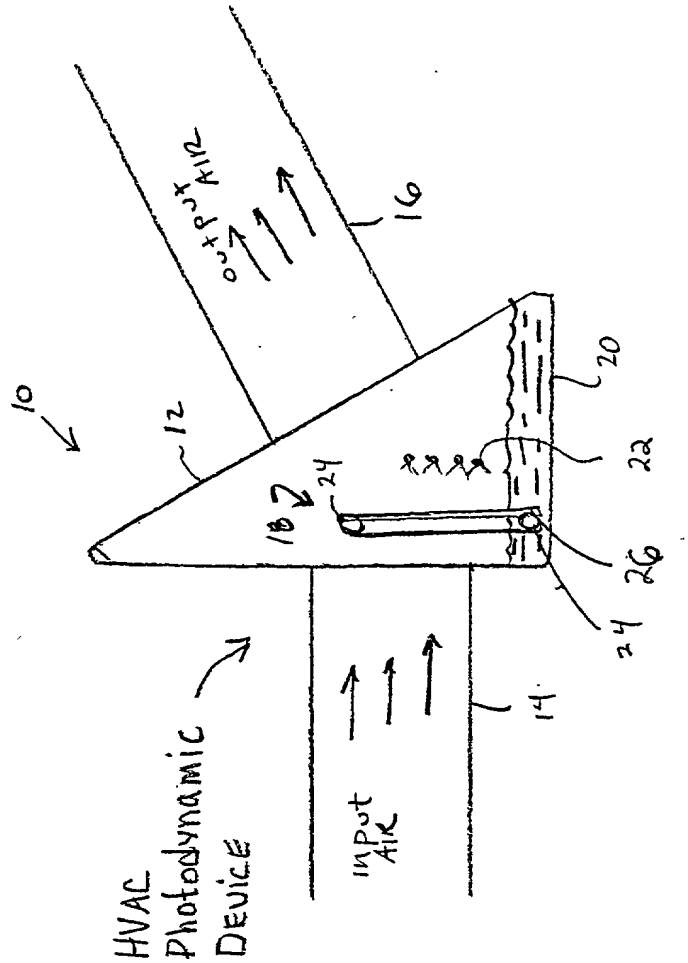
10
12
16
Output Air
20
22
18
24
26
24
14
HVAC
Photodynamic
Device
Input
Air

FIG. 6